

新品 变更

MDH202409058



产 品 规 格 书

SPECIFICATION FOR APPROVAL

产品名称 石英晶体谐振器
Product Name: Quart crystal unit

产品型号 HC-49S
Product Type:

标称频率 8.000000 MHz
Nominal Freq:

明德亨料号 2.4.2.080002045
MDH P/N:

客户料号
Customer P/N:

客户承认
Approved By Customer

签章
Signature:

日期
Date:

Date: 2024年9月25日

批准	审核	拟制
Accepted	Checked	Issued
张圣亮	乔润国	岳 坤

烟台明德亨电子科技有限公司
YanTai MDH Technology Co.,Ltd

ADD.: 中国山东烟台开发区黑龙江路6号
No.6 Heilongjiang Road Yantai Development Zone,
Shandong, China

TEL: 86-535-6372640 FAX: 86-535-6394876

E-Mail: dynamic@public.ytpptt.sd.cn

四川明德亨电子科技有限公司
SiChuan MDH Technology Co.,Ltd

ADD.: 中国四川泸州纳溪区东兴路1号
No.1 Dongxing Road Naxi Zone, Luzhou,
Sichuan,China

TEL: 86-830-2800890

<http://www.mingdeheng.com>**RoHS Compliant**

Revision Record

[illegible]

HC-49S	QUARTZ CRYSTAL UNIT	MDH P/N	2. 4. 2. 080002045		
		REV.	01	PAGE	3/10
CONTENT					
NO.	ITEM				PAGE
1	石英晶体一般规格及特性				4
	Product specification and features				
2	石英晶体外观尺寸及印字				5
	Product outline dimension and marking				
3	石英晶体内部结构				6
	Product internal structure				
4	石英晶体之可靠性				7-9
	Product reliability				
5	生产商及产地说明				10
	Manufacturer and origin				

HC-49S	QUARTZ CRYSTAL UNIT	MDH P/N	2. 4. 2. 080002045		
		REV.	01	PAGE	4/10

1 石英晶体产品规格及特性 / Product specification and features

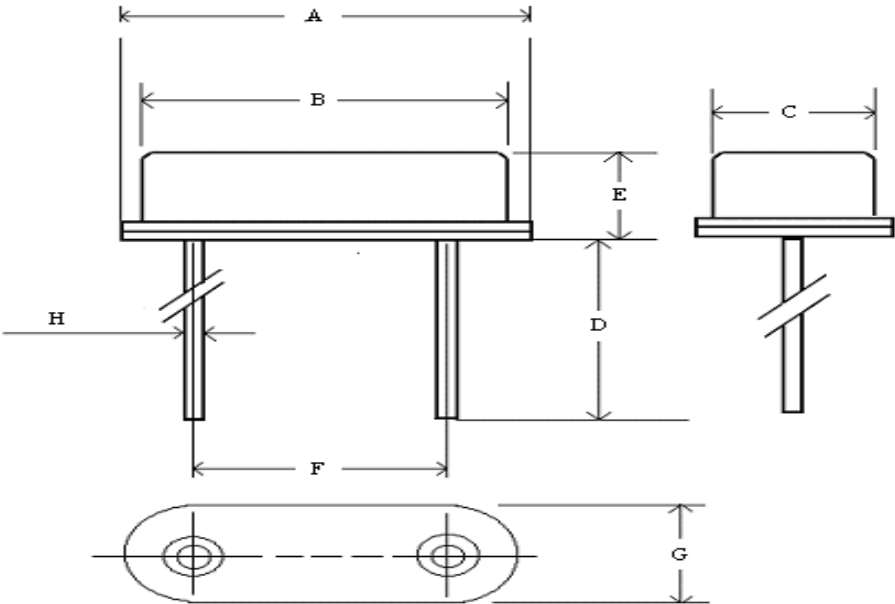
1. 1 一般特性 / General characteristics

Items	Electrical spec.			Unit	Notes
	Min.	Typ.	Max.		
1.Frequency(FL)	8.000000			MHz	-
2.Mode of oscillation	Fundamental			-	-
3.Crystal Cutting Type	AT-CUT			-	Thickness shear mode
4.Frequency tolerance	-20	~	20	ppm	At 25℃±3℃
5.Loading capacitance(CL)	20			pF	-
6.Equivalent resistance(RR)	-	-	60	Ω	Series(ESR)
7.Drive Level (DL)	0.01	100	150	uW	-
8.Temperature stability	-30	~	30	ppm	Ref. to 25℃
	-40	~	85	℃	-
10.Storage temperature range	-55	~	125	℃	-
11.Shut Capacitance(C0)	-	-	7	pF	-
12.Motional Capacitance (C1)	-	-	-	fF	-
13.SPDB	-	-	-3	dB	-
14.Aging	-3	-	3	ppm/Year	-
15.Insulation Resistance	500	-	-	MΩ	DC 100±10V

HC-49S	QUARTZ CRYSTAL UNIT	MDH P/N	2. 4. 2. 080002045		
		REV.	01	PAGE	5/10

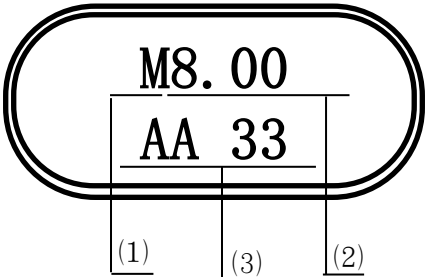
2. 外形尺寸、外观 / Outline dimensions、Appearances

2.1 产品外形尺寸(mm)/ Product outline dimension(mm)



代码	类 型	代码	类 型	代码	类 型
A	10.90 ±0.5 mm	B	9.90 ±0.3 mm	C	3.50 ±0.2 mm
D	7.50 ±0.2 mm	E	3.36 ±0.3 mm	F	4.88 ±0.2 mm
G	4.60 ±0.2 mm	H	Φ0.45 ±0.1 mm		

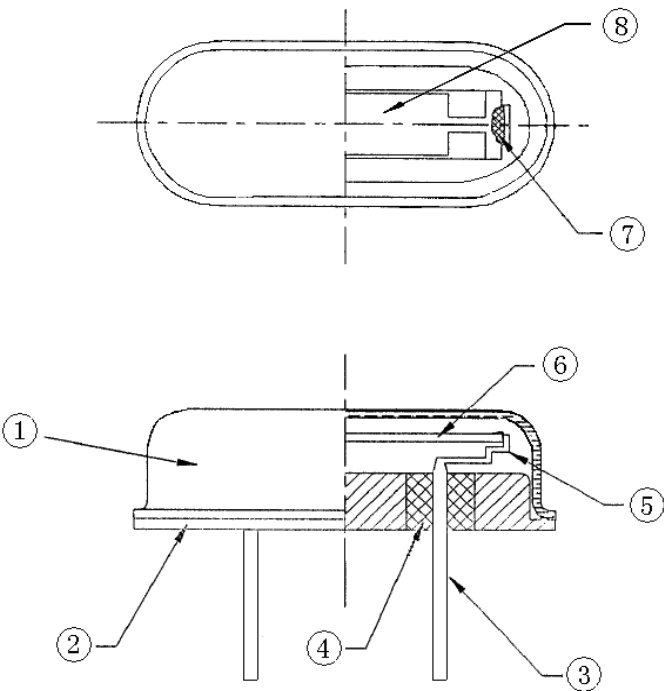
2.2 印字 Marking



(1)	代表公司Logo
(2)	代表标称频率
(3)	代表批次号

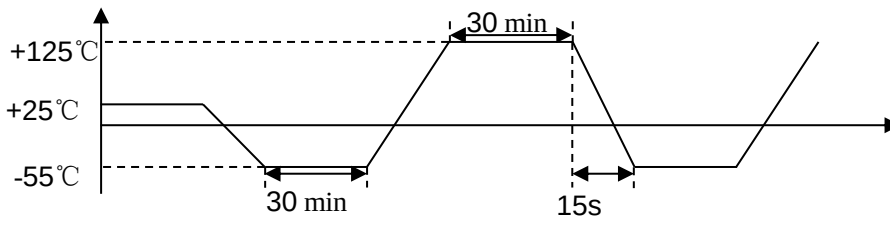
HC-49S	QUARTZ CRYSTAL UNIT	MDH P/N	2. 4. 2. 080002045		
		REV.	01	PAGE	6/10

3. 内部构造图 / Product internal structure



No	名称	材料	颜色	Remark
	Description	Material	Color	
①	外壳/ Can	Nickel Silver	银白	
②	底板/ Base	Fe	银白	
③	引线/ Lead	Kovar	银白	
④	玻璃绝缘子/ Glass	Glass	褐色	
⑤	簧片/ Supporter	Cu、Zn、Ni	银白	
⑥	晶片/ Blank	SiO ₂	透明	
⑦	银胶/ Epoxy	Ag&resin	银白	
⑧	电极/ Electrode	Ag	银白	

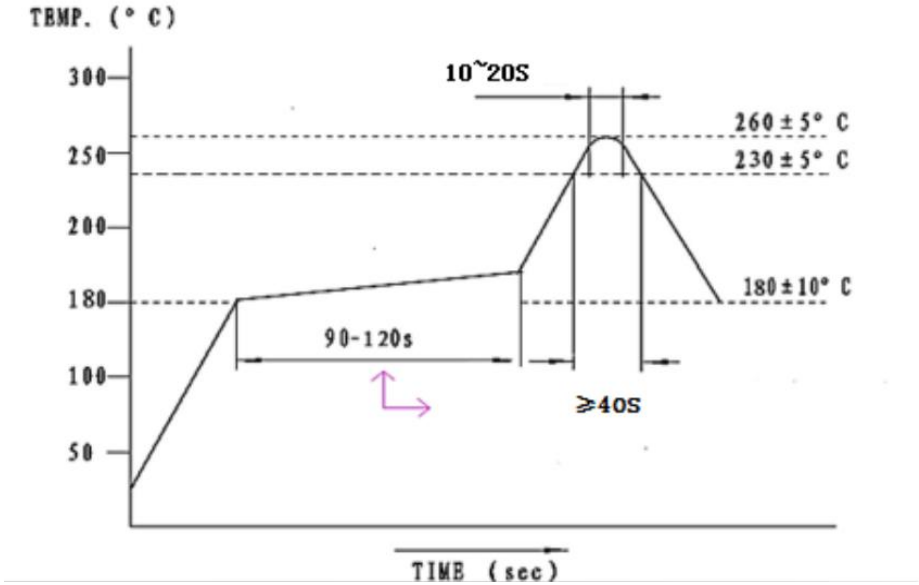
4. 石英晶体之可靠性 / Product reliability

项 目 Item	条 件 (Condition)	结 果 Result
A. 1	耐低温性 (耐寒性) 测试 (Cold resistance)	(I)
	Stored at $-40\pm2^{\circ}\text{C}$ for 500 ± 2 hrs then $25\pm2^{\circ}\text{C}$ 2 hrs before testing	
A. 2	耐高温性 (耐热性) 测试 (Heat resistance)	(I)
	Stored at $125\pm2^{\circ}\text{C}$ for 500 ± 2 hrs then 25°C 2 hrs before testing	
A. 3	耐湿热性 (Humidity Resistance Result)	(I)
	稳态温度: $85\pm2^{\circ}\text{C}$; 湿度: $85\pm3\%\text{RH}$; 时间: $500\pm2\text{h}$;	
	Steady temperature: $85\pm2^{\circ}\text{C}$; humidity: $85\pm3\%\text{RH}$; time: $500\pm2\text{h}$	
A. 4	老化 (Aging)	(I)
	Stored at $85\pm2^{\circ}\text{C}$ for $720\pm2\text{Hrs}$ then $25\pm2^{\circ}\text{C}$ 2 Hrs before testing	
A. 5	气密性 (Leakage)	(VI)
	细漏Fine leak: Put the product in the Helium pressure tank and add 5Atm, 2hrs.	
A. 6	温度循环 (Temperature Cycle)	(I)
- 55°C ~ 125°C, Retain 30Min, 100 cycles  温度循环 (Temperature Cycle)		

HC-49S	QUARTZ CRYSTAL UNIT	MDH P/N	2. 4. 2. 080002045		
		REV.	01	PAGE	8/10

4.1 机械性能 / Mechanism characteristics

B. 1	跌落测试 (Drop Test)	(I)
	Device are dropped from a height of 100 cm onto 20mm thickness Wooden Board executing 3 times of random drops.	
B. 2	耐振性 (Resistance of Vibration)	(I)
	Frequency: 10~55Hz, amplitude(total excursion): 1.5mm, 3 direction (X,Y,Z) each 2 hrs	
B. 3	引线弯曲强度测试 (The Lead Terminal Bending Strength Test)	(I & II)
	拉力测试: 牵引引线, 拉力: 5Kg, 牵引时间: 10±1S; 弯曲测试: 将引线从末端处弯曲90°, 再恢复原状, 连续2次; Tensile test: Traction Line, tension: 5 kg, Traction Time: 101S; Bending Test: The wire from the end of the Bending 90, and then restore the original, 2 consecutive times;	
B. 4	可焊性试验 (Solderability)	(III)
	245±5℃, 5±1sec	
B. 5	耐焊接热 (Reflow) Resistance to soldering heat (Reflow)	(I)
	260± 5℃; ≥10S; 3Times	



HC-49S	QUARTZ CRYSTAL UNIT	MDH P/N	2. 4. 2. 080002045		
		REV.	01	PAGE	9/10

项目 Item	结果编号 Result NO.	规格要求 Specification Requirements
1	(I)	频率变化 $<\pm 10\text{ppm}$; 电阻变化 $<\pm 5\Omega$ 或规格电阻的 $\pm 15\%$, 取大者 Frequency variation $<\pm 10\text{ppm}$; Resistance variation $<\pm 5\Omega$ or $\pm 15\%$ of RR spec., select the bigger value.
2	(II)	引线无折断, 在10倍放大镜下观察玻璃体无裂纹 The lead is no broken, the Glass is no crackle under the observation of 10 times Magnifier.
3	(III)	上锡覆盖率高于95% The covering rate of Tin-plating is more than 95%.
4	(IV)	无气泡在晶体表面沉淀或冒出水面, 绝缘阻抗 $500\text{ M}\Omega$ Min 100VDC $\pm 15\text{VDC}$ There is no bubbles after the Crystal is dipped in the water Insulation Resistance: $500\text{ M}\Omega$ Min $100\text{VDC}\pm 15\text{VDC}$
5	(V)	在10倍放大镜下观察石英晶体无裂纹 The Crystal is no crackle under the observation of 10 times Magnifier.
6	(VI)	$5*10^{-9}\text{Pa}\cdot\text{m}^3/\text{s}$ Max

HC-49S	QUARTZ CRYSTAL UNIT	MDH P/N	2. 4. 2. 080002045		
		REV.	01	PAGE	10/10

5. 生产商及产地说明 / Manufacturer and origin

生产商/Manufacturer: 烟台明德亨电子科技有限公司 ☒
YanTai MDH Technology Co.,Ltd

 四川明德亨电子科技有限公司
SiChuan MDH Technology Co.,Ltd

5. 1 包装规格Package specification



小袋密封包装
0.2K / 袋



内包装方式2K/盒



外包装方式20K/箱